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The analysis of trends in GDP and cyclical nature of GDP changes in Baltic states

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Abstract

This paper analyzes the Baltic countries' trends in GDP and cyclical nature of GDP changes. Such analysis is necessary while assessing country's current economic situation. A brief literature review was conducted; methods used included tools of statistical analysis. The presented results showed that seasonally adjusted GDP changes tend to have similar distribution for Estonia and Lithuania, cyclical behavior of seasonally adjusted GDP changes tends to have similar trends for three Baltic states.

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Keywords: Economic growth; cycle; GDP; economic fluctuation.

1. Introduction

While assessing country's current economic situation it is necessary to evaluate the cyclical nature of GDP changes. Economic cycles and fluctuations have an impact on each of the country's economic performance (Ciegis, Nakciunaite and Mikalauskiene, 2013). Economic development includes trends of economic growth and cycle that indicates the period when real development is different from the default trend. From this aspect, economic growth and business cycle are two related components of economic development. Economic growth is a potential increase of country's GDP (Samuelson, 1995). Many Lithuanian and foreign scientists analyze the business cycle fluctuations, their causes and effects on the national economy. One of the first works analyzing business cycles was

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developed by scientists from University of California (Mitchell, 1913). These researchers further developed this subject in subsequent works.

According to Burns and Mitchell (1946) business cycles are a type of fluctuations found in country's overall economic activity. Economic or business cycle can be defined as the dynamics of main macroeconomic indicators (output, unemployment, consumption, investment, and prices). This cycle can be divided into four phases: peak, recession, trough and recovery. These phases are repeated constantly, but not periodically - the economic cycle duration can range from one to ten or twelve years. Thus a cycle can be viewed as a series of turning points (peaks and troughs) with alternating phases of recession and recovery. Business cycles differ from each other in time and intensity, but they all have same phases (Šarkinienė & Kvainauskaitė, 2005).

The main questions that arise for most scientists are: what causes the economic fluctuations; what affects the ups and downs in the economy. Monetary, fiscal policies, as well as oil price spikes make a long-term effect on business cycles (Rabelo, 2005). Analyzing oil and energy price changes, researchers found that price changes in the short term does not have a significant impact on business cycles (Barsky & Killian, 2004; Kim & Loungani, 1992; Rotemberg & Woodford, 1996, Finn 2000). „Although energy prices are highly volatile, energy costs are too small as a fraction of value-added for changes in energy prices to have a major impact on economic activity"(Rebelo, 2005). Fiscal policy can help stabilize the economy while maintaining aggregate demand and private sector income during the economic downturn; and regulate economic activity in the periods of strong growth (Sinevičienė & Vasiliauskaitė, 2010). Business cycles are heavily influenced by technology shocks. Prescott (1986) argues that "account for more than half the fluctuations in the post-war period with a best point estimate near 75%". Gali (1999) argues that technology shocks are necessary, they act as an impulse. His research has proven that technological shocks have a positive effect on the labor market in the long term.

Although economic (business) cycles are defined as fluctuations in country's overall economic activity, this activity can be represented by dynamics of one macroeconomic variable, such as gross domestic product.

While performing country's economic analysis it is also important to evaluate the economic development trends in neighboring countries. Therefore this article analyzes the economic growth dynamics based on GDP changes in three Baltic countries: Lithuania, Latvia, and Estonia. The Baltic countries are compared by the trend in GDP. According to Mačys (2012) the three Baltic countries are often presented as one region because of analogous natural, historic, political and socio-economic development and business environment.

Aim of this paper is to analyze the trends in GDP and cyclical nature of GDP changes in Baltic countries. In worldwide or European context it is appropriate to consider the Baltic countries as one region. But it is important to examine and compare the economic development and its trends in each country of this region. This would then allow a detailed study of impact of country's macro-economic indicators, fiscal and monetary policy measures on the economic growth.

Methods used include comparative, systematic and logical analysis of scientific literature related to economic cycles, trends in GDP and GDP's cyclical nature. The analysis of the situation in the country was performed using tool of statistical analysis.

2. Method

The data used in this study was seasonally adjusted and working day adjusted. Seasonal adjustment provides a clearer view of non-seasonal changes in times series data that could otherwise be overshadowed by the seasonal differences. A seasonal adjustment is therefore aimed to obtain a clear picture of the general trend. The statistical analysis (descriptive statistics and histogram plots) provides generalizations of the data used in the study, allows comparing and shows main similarities and differences.

Further study is aimed at economic cycle comparison. Cycles are described in time series measured at regular time intervals. One of the main goals of time series analysis is to find a variety of patterns and describe it using mathematical models which predict future time series values. The dynamics of economic cycle can be approximated by various periodical or polynomial functions. In this study the approximation by m-th degree polynomial function is used:

$$f(x) = a_0 + a_1x + a_2x^2 + \ldots + a_{m-1}x^{m-1} + a_mx^m \quad (1)$$